

BIOMOLECULES

Previous Years' CBSE Board Questions

14.1 Carbohydrates

VSA (1 mark)

- Write the name of two monosaccharides obtained on hydrolysis of lactose sugar.  
(Delhi 2016)
- Write the structural difference between starch and cellulose.  
(AI 2016)
- Which one of the following is a disaccharide : Starch, Maltose, Fructose, Glucose?  
(Delhi 2015)
- Write the product obtained when *D*-glucose reacts with  $\text{H}_2\text{N}-\text{OH}$ .  
(AI 2015)
- Which one of the following is a monosaccharide : starch, maltose, fructose, cellulose  
(Foreign 2015)
- Which of the two components of starch is water soluble?  
(Delhi 2014)
- Write the product formed on reaction of *D*-glucose with  $\text{Br}_2$  water.  
(Delhi 2014)
- Write the product formed when glucose is treated with HI.  
(Delhi 2014)
- Define the following term :  
Anomers  
(AI 2014, Foreign 2014)
- Define the following term :  
Polysaccharides  
(Foreign 2014)
- Define the following term :  
Invert sugar  
(Foreign 2014, Delhi 2010)
- What is a glycosidic linkage?  
(Delhi 2013, 2009)
- Name two components of starch.  
(Delhi 2013C)
- Write the structure of the product obtained when glucose is oxidised with nitric acid.  
(AI 2012)
- Write a reaction which shows that all the carbon atoms in glucose are linked in a straight chain.  
(AI 2012)
- State two functions of carbohydrates.  
(AI 2012C)

- Explain what is meant by the following :  
pyranose structure of glucose?  
(AI, Foreign 2011)
- What is meant by 'reducing sugars'?  
(AI 2010)
- What are the products of hydrolysis of sucrose?  
(AI 2010)
- Name of the expected products of hydrolysis of lactose.  
(Delhi 2010C, 2009C)
- What is the structural feature characterising reducing sugar?  
(Delhi 2009C)
- Describe the following, giving an example :  
Glycosidic linkage  
(AI 2008)

SA I (2 marks)

- Enumerate the reactions of glucose which cannot be explained by its open chain structures.  
(Delhi 2014C, AI 2011C, 2010C, 2009C)
- Write any two reactions of glucose which cannot be explained by the open chain structure of glucose molecule.  
(Delhi 2012)
- Write down the structures and names of the products formed when *D*-glucose is treated with (i) Hydroxylamine (ii) Acetic anhydride.  
(AI 2012C)
- Write down the structures and names of the products formed when *D*-glucose is treated with  
(i) Bromine water  
(ii) Hydrogen Iodide (Prolonged heating)  
(AI 2012C)
- What is essentially the difference between  $\alpha$ -form and  $\beta$ -form of glucose? Explain.  
(Delhi 2011)
- Write such reactions and facts about glucose which can not be explained by open chain structure.  
(AI 2011)
- Name the products of hydrolysis of (i) sucrose and (ii) lactose.  
(AI 2010, 2009)
- Name the products of hydrolysis of sucrose. Why is sucrose not a reducing sugar?  
(Delhi 2010)

31. What happens (write chemical equations) when *D*-glucose is treated with the following :  
 (i) HI  
 (ii) Bromine water (AI 2010C)
32. Answer the following question briefly :  
 How are carbohydrates classified? (AI 2007)

### SA II (3 marks)

33. Define the following terms :  
 (i) Glycosidic linkage  
 (ii) Invert sugar  
 (iii) Oligosaccharides (AI 2014)
34. What is essentially the difference between  $\alpha$ -glucose and  $\beta$ -glucose? What is meant by pyranose structure of glucose?
35. Mention the structural feature characterising reducing sugar. (Delhi 2011C)
36. What happens when *D*-glucose is treated with the following reagents :  
 (i) HI  
 (ii) Bromine water  
 (iii)  $\text{HNO}_3$  (AI 2008)
37. Name the three major classes of carbohydrates & give an example of each of these classes. (Delhi 2007)

## 14.2 Proteins

### VSA (1 mark)

38. Give one example each for fibrous protein and globular protein. (AI 2016, Delhi 2014, AI 2013C)
39. What is the difference between fibrous protein and globular protein? (Delhi 2015)
40. Amino acids show amphoteric behaviour. Why? (AI 2015)
41. What is the difference between acidic amino acids and basic amino acids? (Foreign 2015)
42. What type of linkage is responsible for the formation of proteins? (Delhi, Foreign 2014)
43. Define the following term :  
 Essential amino acids (AI 2014)
44. Define the following term :  
 Denaturation of proteins (Foreign 2014)

45. Define the following term :  
 Amino acids (Foreign 2014)
46. Define a 'Peptide linkage'. (AI 2014C, 2011, Foreign 2011)
47. Where does the water present in the egg go after boiling the egg? (Delhi 2012C)
48. Explain the following term :  
 Polypeptides (Delhi 2010)

### SA I (2 marks)

49. Describe what you understand by primary structure and secondary structure of proteins? (Delhi 2011)
50. Explain what is meant by a peptide linkage. (Delhi 2011)
51. State what you understand by primary and secondary structure of proteins. (Foreign 2011)
52. Define the following terms in relation to proteins:  
 (i) Peptide bond  
 (ii) Denaturation of proteins (Delhi 2008)
53. Describe the following terms in reference of proteins :  
 (i) Primary structure  
 (ii) Denaturation (AI 2008)
54. What are essential and non-essential amino acids? Give one example of each type. (AI 2008C)
55. Mention the type of linkage responsible for the formation of the following :  
 (i) Primary structure of proteins  
 (ii) Cross-linkage of polypeptide chains  
 (iii)  $\alpha$ -helix formation  
 (iv)  $\beta$ -sheet structure (AI 2008C)
56. Answer the following :  
 (i) What type of linkage is responsible for the primary structure of proteins?  
 (ii) Name the location where protein synthesis occurs in our body. (Delhi 2007)

### SA II (3 marks)

57. Define the following terms as related to proteins:  
 (i) Peptide linkage  
 (ii) Primary structure  
 (iii) Denaturation (AI 2015, 2014)

58. What are essential and nonessential amino acids? Give two examples of each.  
(AI 2014C, Delhi 2012C)
59. (a) Give two differences between globular and fibrous proteins.  
(b) What change occurs in the nature of egg protein on boiling? (Delhi 2013C)
60. Amino acids may be acidic, alkaline or neutral, How does this happen? What are essential and non-essential amino acids? Name one of each type. (AI 2010)
61. Differentiate between fibrous proteins and globular proteins. What is meant by the denaturation of a protein? (AI 2010)
62. (a) What type of bonding helps in stabilising of  $\alpha$ -helix structure of proteins?  
(b) Differentiate between globular and fibrous proteins. (Delhi 2010C)
63. What are proteins? State a difference between globular and fibrous proteins. (AI 2007)
72. Deficiency of which vitamin causes rickets?  
(Delhi 2014)
73. Deficiency of which vitamin causes scurvy?  
(Delhi 2014)
74. Define the following term:  
Vitamins (Foreign 2014)
75. Why are vitamin A and vitamin C essential for us?  
(Delhi 2014C)
76. Name the deficiency diseases resulting from lack of Vitamins A and E in the diet.  
(Delhi 2013C)
77. Name one of the water soluble vitamin which is powerful antioxidant. Give its one natural source.  
(Delhi 2013C, AI 2012C)
78. How are hormones and vitamins different in respect of their source and functions?  
(AI 2013C)
79. Name the only vitamin which can be synthesized in our body. Name the disease caused due to the deficiency of this vitamin. (Delhi 2013C)
80. Name the deficiency disease resulting from lack of vitamin A in the diet. (Delhi 2011C)
81. The deficiency of which vitamin causes the disease, 'pernicious anaemia'? (AI 2011C)
82. What are vitamins? Deficiency of which vitamin causes  
(i) Pernicious anaemia?  
(ii) Convulsions? (AI 2010C)
83. Name two water soluble vitamins, their sources and diseases caused due to their deficiency in diet. (Delhi 2009)

### 14.3 Enzymes

#### VSA (1 mark)

64. Define the following term:  
Enzymes (Foreign 2014, AI 2007)
65. What are enzymes? (AI 2014C)
66. What is meant by biocatalysts? (Delhi 2012)

#### SA I (2 marks)

67. List two characteristic features of enzymes.  
(AI 2007)

### 14.4 Vitamins

#### VSA (1 mark)

68. Why Vitamin C cannot be stored in our body?  
(Delhi 2016)
69. Write the name of vitamin whose deficiency causes bone deformities in children.  
(Delhi 2015)
70. Write the name of the vitamin whose deficiency causes bleeding of gums. (Foreign 2015)
71. Deficiency of which vitamin causes night-blindness? (Delhi 2014)
84. Name two fat soluble vitamins, their sources and the diseases caused due to their deficiency in diet. (AI 2009)
85. How are the vitamins classified? Mention the chief sources of vitamins A and C. (AI 2008)
86. B-complex is an often prescribed vitamin. What is complex about it and what is its usefulness?  
(AI 2007)
87. Answer the following questions briefly :  
(i) What are the two good sources of vitamin A?  
(ii) Why is vitamin C essential to us? Give its important sources. (AI 2007)

**SA II (3 marks)**

88. How are vitamins classified? Name the vitamin responsible for the coagulation of blood.  
(Delhi 2015C)

**VBQ (3 marks)**

89. After watching a programme on TV about the adverse effects of junk food and soft drinks on the health of school children, Sonali, a student of Class XII, discussed the issue with the school principal. Principal immediately instructed the canteen contractor to replace the fast food with the fibre and vitamins rich food like sprouts, salad, fruits etc. This decision was welcomed by the parents and the students.

After reading the above passage, answer the following questions:

- (a) What values are expressed by Sonali and the Principal of the school?
- (b) Give two examples of water-soluble vitamins.  
(Delhi 2013)
90. Shanti, a domestic helper of Mrs. Anuradha, fainted while mopping the floor. Mrs. Anuradha immediately took her to the nearby hospital where she was diagnosed to be severely 'anaemic'. The doctor prescribed an iron rich diet and multivitamins supplement to her. Mrs. Anuradha supported her financially to get the medicines. After a month, Shanti was diagnosed to be normal.

After reading the above passage, answer the following questions:

- (i) What values are displayed by Mrs. Anuradha?
- (ii) Name the vitamin whose deficiency causes 'pernicious anaemia'.
- (iii) Give an example of a water soluble vitamin.  
(AI 2013)

## 14.5 Nucleic Acids

**VSA (1 mark)**

91. What is difference between a nucleoside and nucleotide?  
(Delhi 2016, 2014C)

92. What type of linkage is present in nucleic acids?  
(AI 2016)

93. Name of the base that is found in nucleotide of RNA only.  
(Delhi 2014)

94. Define the following term:  
Nucleoside  
(Foregin 2014)

95. Mention one important function of nucleic acids in our body.  
(AI 2013C)

96. Name of the purines present in DNA.(AI 2007)

**SA I (2 marks)**

97. Write the structural and functional difference between DNA and RNA.  
(Delhi 2013C)

98. Write the main structural difference between DNA and RNA. Of the two bases, thymine and uracil, which one is present in DNA?  
(Delhi 2012)

99. Name the bases present in RNA. Which one of these is not present in DNA?  
(Delhi 2011)

100. Write the main structural difference between DNA and RNA. Of the four bases, name those which are common to both DNA and RNA.  
(AI 2011)

101. Name the four bases present in DNA. Which one of these is not present in RNA?  
(AI 2009)

102. (a) What is the structural difference between a nucleoside and a nucleotide?  
(b) The two strands in DNA are not identical but are complementary. Explain.  
(Delhi 2009C)

103. When RNA is hydrolysed, there is no relationship among the quantities of different bases formed. What does this fact suggest about the structure of RNA?  
(AI 2008C)

**SA II (3 marks)**

104. What are the different types of RNA found in cells of organisms? State the functions of each type.  
(Delhi 2012C)

105. (a) Write the important structural difference between DNA and RNA.  
(b) Mention the names of the bases produced on hydrolysis of DNA.  
(AI 2009C)